

(12) **United States Patent**
Mauro

(10) **Patent No.:** **US 9,475,363 B2**
(45) **Date of Patent:** **Oct. 25, 2016**

(54) **UNIVERSAL GOLF CART WINDSHIELD ASSEMBLY**

(71) Applicant: **Ed Mauro**, Palm Harbor, FL (US)

(72) Inventor: **Ed Mauro**, Palm Harbor, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/853,474**

(22) Filed: **Sep. 14, 2015**

(65) **Prior Publication Data**

US 2016/0001639 A1 Jan. 7, 2016

Related U.S. Application Data

(62) Division of application No. 14/288,502, filed on May 28, 2014, now Pat. No. 9,132,716.

(51) **Int. Cl.**
B60J 1/00 (2006.01)
B60J 1/06 (2006.01)

(52) **U.S. Cl.**
CPC **B60J 1/006** (2013.01); **B60J 1/007** (2013.01); **B60J 1/06** (2013.01)

(58) **Field of Classification Search**
CPC .. C08L 29/14; C08L 67/02; B32B 17/10036; B32B 17/10761; B60J 1/06; B60J 5/0487; B60J 1/04; B64C 1/1492; A63B 55/06
USPC 296/84.1, 96.21, 102, 79; 114/361; 280/DIG. 5, DIG. 6
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,773,695 A * 9/1988 Jones B60J 1/06 280/DIG. 5
4,792,175 A * 12/1988 Gerber B60J 1/06 280/DIG. 5
4,819,979 A * 4/1989 Moglia B60J 1/20 296/77.1
5,192,109 A * 3/1993 Roberts B60J 1/06 280/DIG. 5

5,195,797 A * 3/1993 Hobbs B60J 1/04 280/DIG. 5
5,385,379 A * 1/1995 Heavner B60J 1/04 280/DIG. 5
5,385,380 A * 1/1995 Heavner B60J 1/04 280/DIG. 5
5,568,953 A * 10/1996 Showalter E05C 3/042 292/101
5,975,615 A * 11/1999 Showalter B60J 1/06 280/DIG. 5
6,158,801 A * 12/2000 Tucker B60J 5/0487 296/146.1
6,206,447 B1 * 3/2001 Nation A63B 57/00 160/368.1
6,216,714 B1 * 4/2001 Tucker B60J 7/1282 135/88.01
6,302,440 B1 * 10/2001 Goodstein B60R 11/00 280/762
RE38,272 E 10/2003 Nation
6,663,158 B1 * 12/2003 Showalter B60J 1/02 280/DIG. 5
7,311,347 B1 * 12/2007 Aller B60J 1/06 296/77.1
8,087,711 B1 * 1/2012 Mauro B60J 1/06 280/DIG. 5
2005/0093331 A1 * 5/2005 Moskos B62D 25/00 296/102

(Continued)

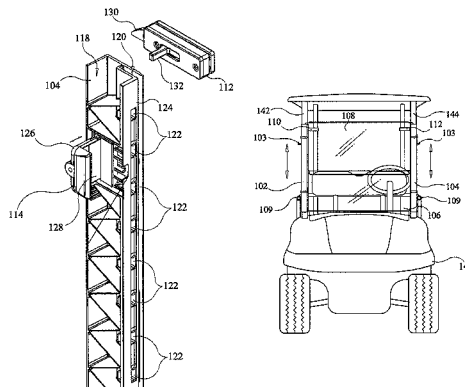
Primary Examiner — Kiran B Patel

(74) *Attorney, Agent, or Firm* — Matthew G. McKinney, Esq.; Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.

(57) **ABSTRACT**

A universal golf cart windshield assembly includes a pair of elongated rails and a bracket secured to each rail, where each bracket is configured to clamp over a vertical support member of a golf cart. A longitudinal slot is disposed on each rail and a flange is joined along a longitudinal edge of the longitudinal slot and extends generally at a right angle to the slot. A plurality of apertures are disposed on the flange of each rail. The assembly also includes a lower windshield pane and an upper windshield pane, where opposing edges of the upper windshield pane are slidingly engaged with the respective longitudinal slot of each rail. In addition, the assembly also includes a spring loaded latch secured to the upper windshield pane, where the pin is adapted to engage a desired aperture of the flange to restrain the upper windshield pane in a desired vertical position.

10 Claims, 6 Drawing Sheets



(56)	References Cited				2011/0001331	A1 *	1/2011	Hirneise	B60J 1/06 296/87
U.S. PATENT DOCUMENTS					2011/0260019	A1 *	10/2011	Held	B60J 5/08 248/201
2006/0091089	A1 *	5/2006	Christiansen	A63B 55/10 211/70.2	2012/0098290	A1 *	4/2012	Miller	B60J 7/1621 296/89
2006/0113817	A1 *	6/2006	Gasper	B60J 7/10 296/77.1	2013/0062905	A1 *	3/2013	Held	B60J 5/08 296/141
2008/0265611	A1 *	10/2008	Flynn	B60J 7/1226 296/108	2014/0203588	A1 *	7/2014	Tyrer	B60J 1/006 296/79
2009/0230714	A1 *	9/2009	Reese	B60J 1/06 296/92	2015/0043051	A1 *	2/2015	Woodrow	B60J 3/04 359/241
2009/0278373	A1 *	11/2009	Rouzer	B60J 1/06 296/92	2015/0102630	A1 *	4/2015	Guzzetta	B60J 5/065 296/147
2010/0060027	A1 *	3/2010	Marsh	B60J 5/0487 296/79	* cited by examiner				

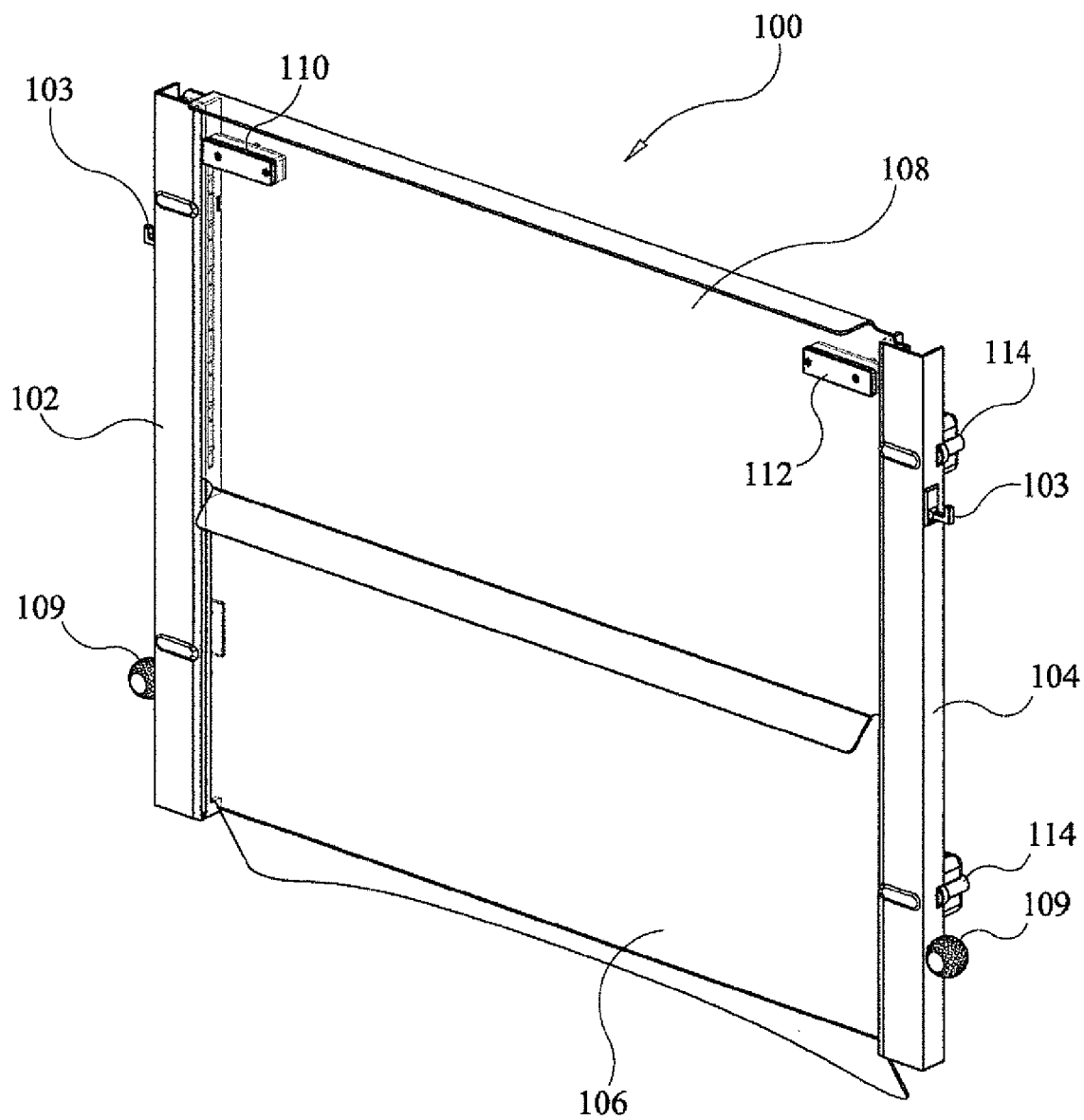


FIG. 1

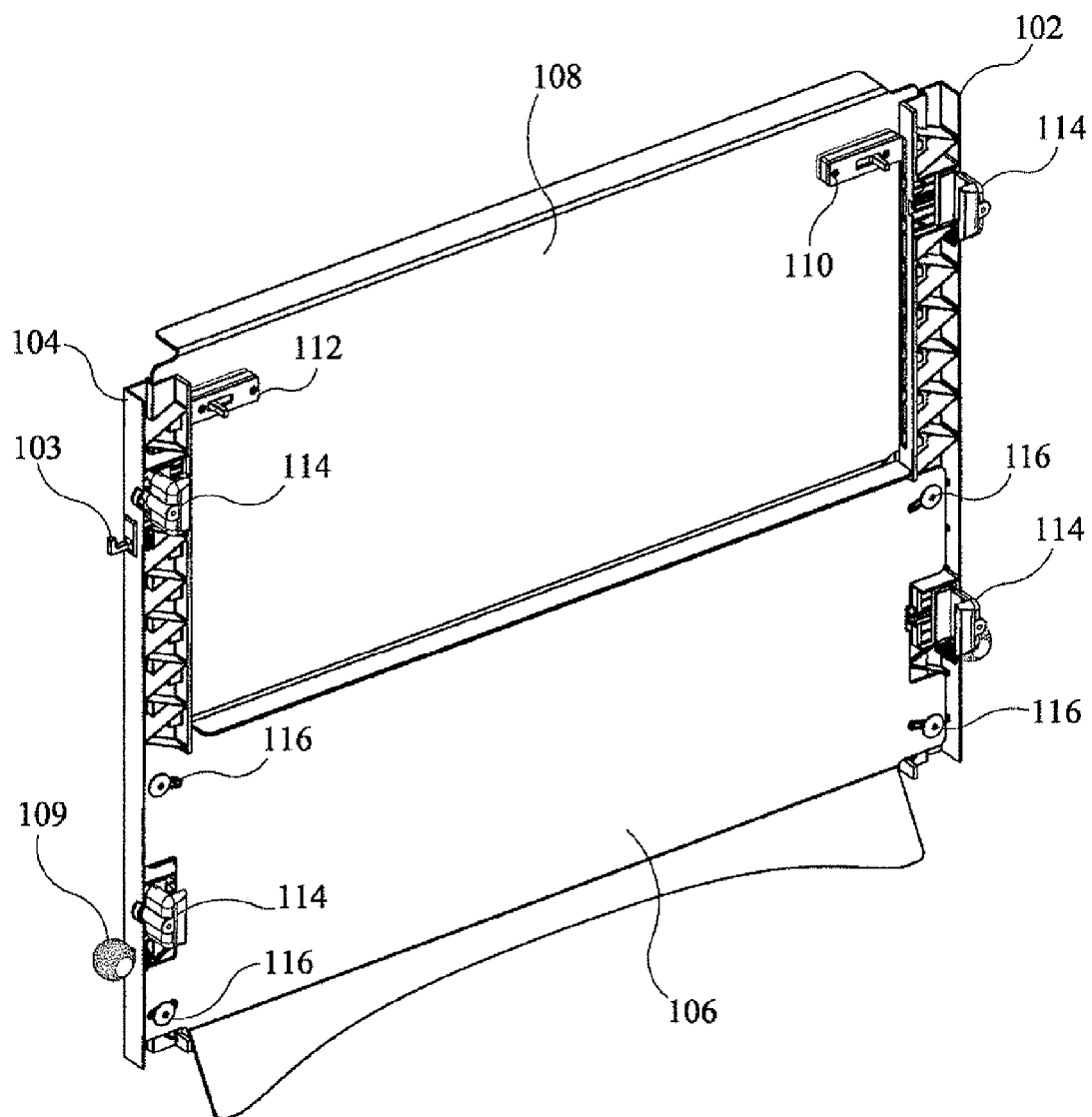


FIG. 2

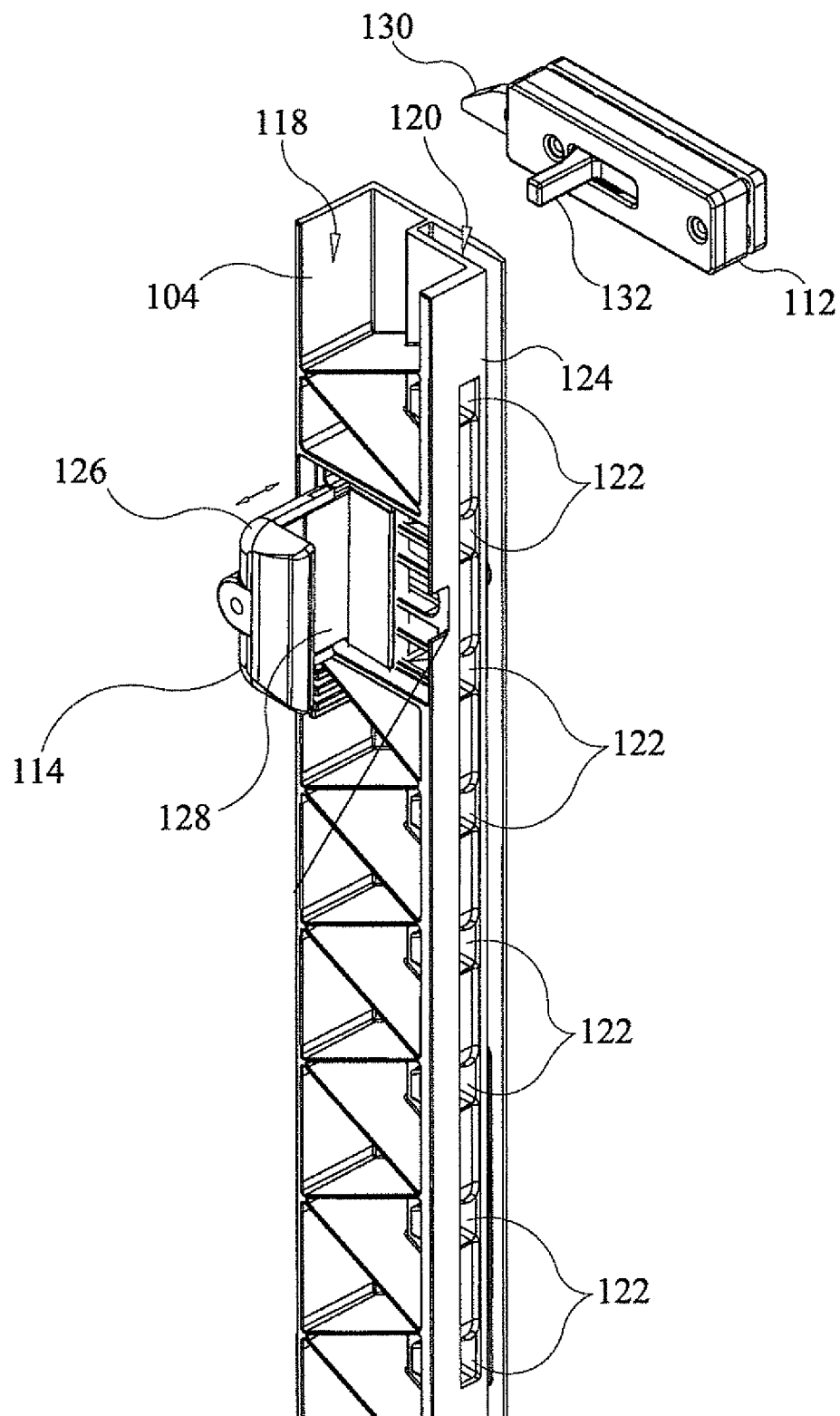


FIG. 3

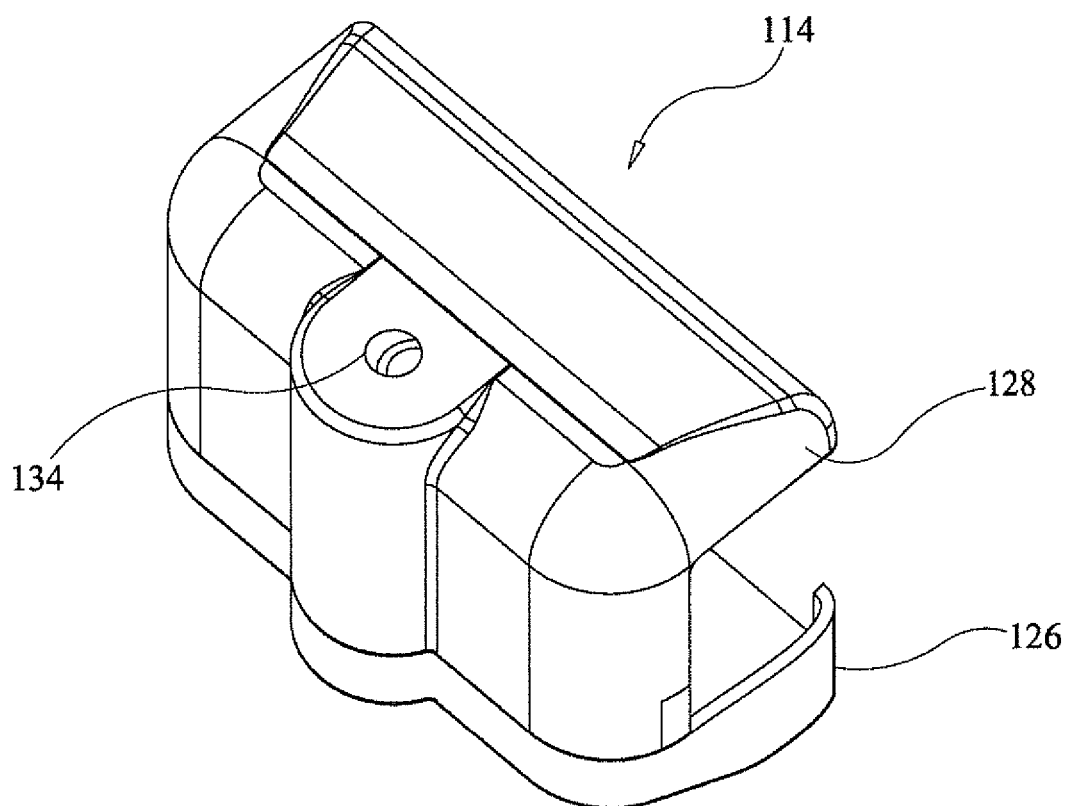


FIG. 4

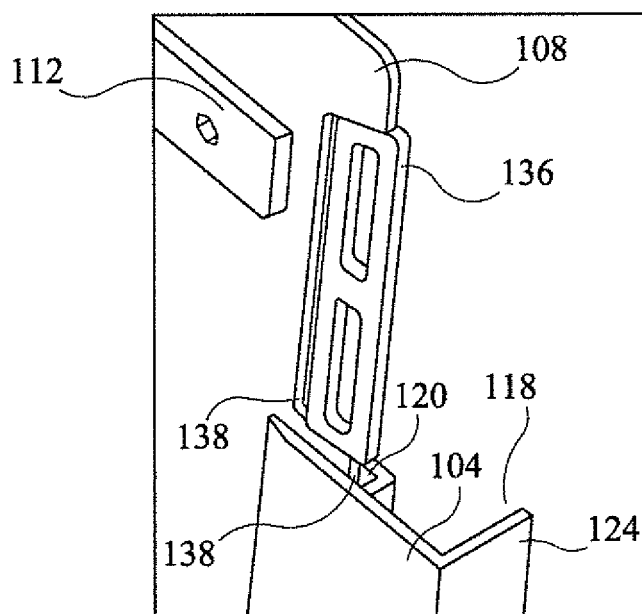


FIG. 5

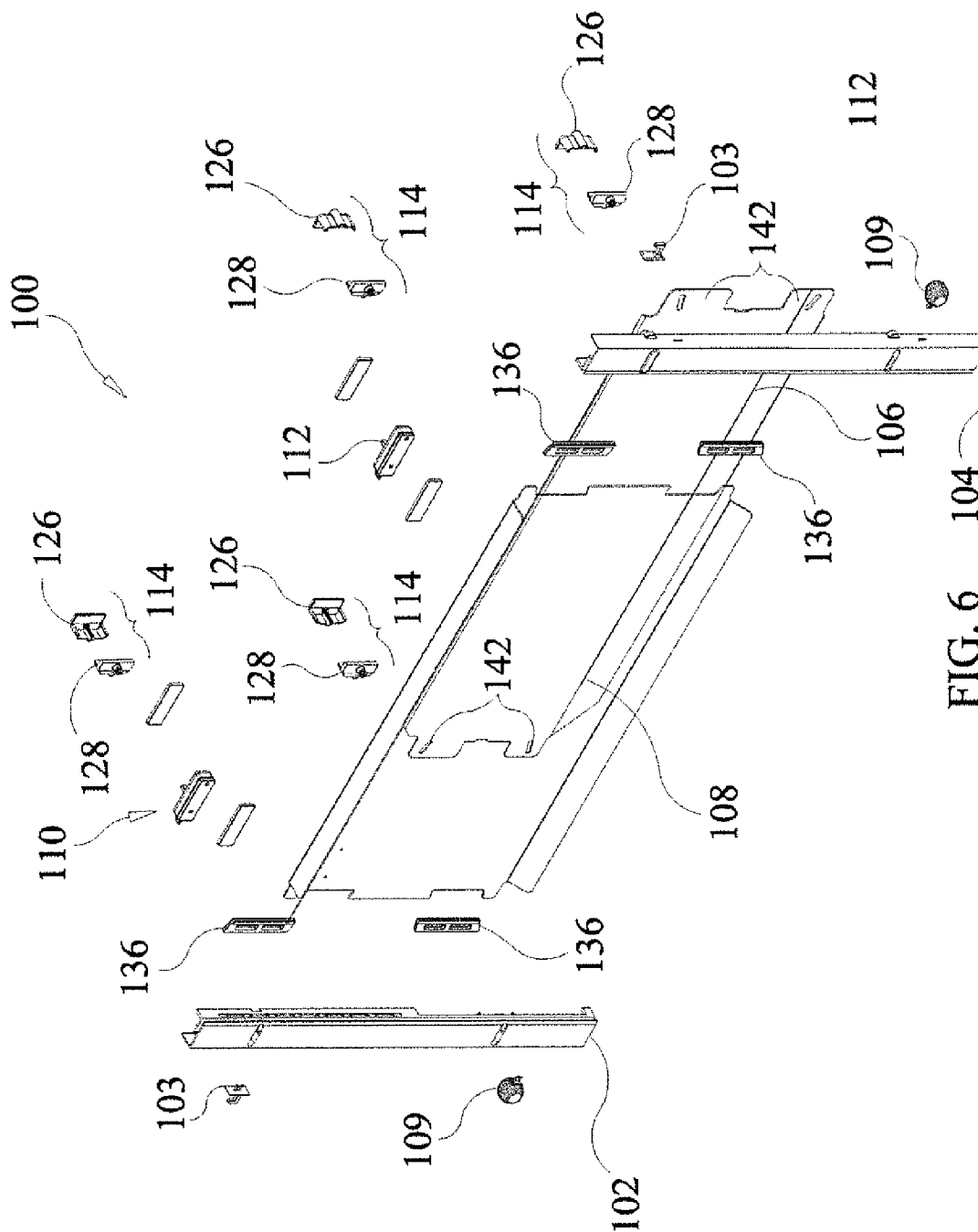


FIG. 6

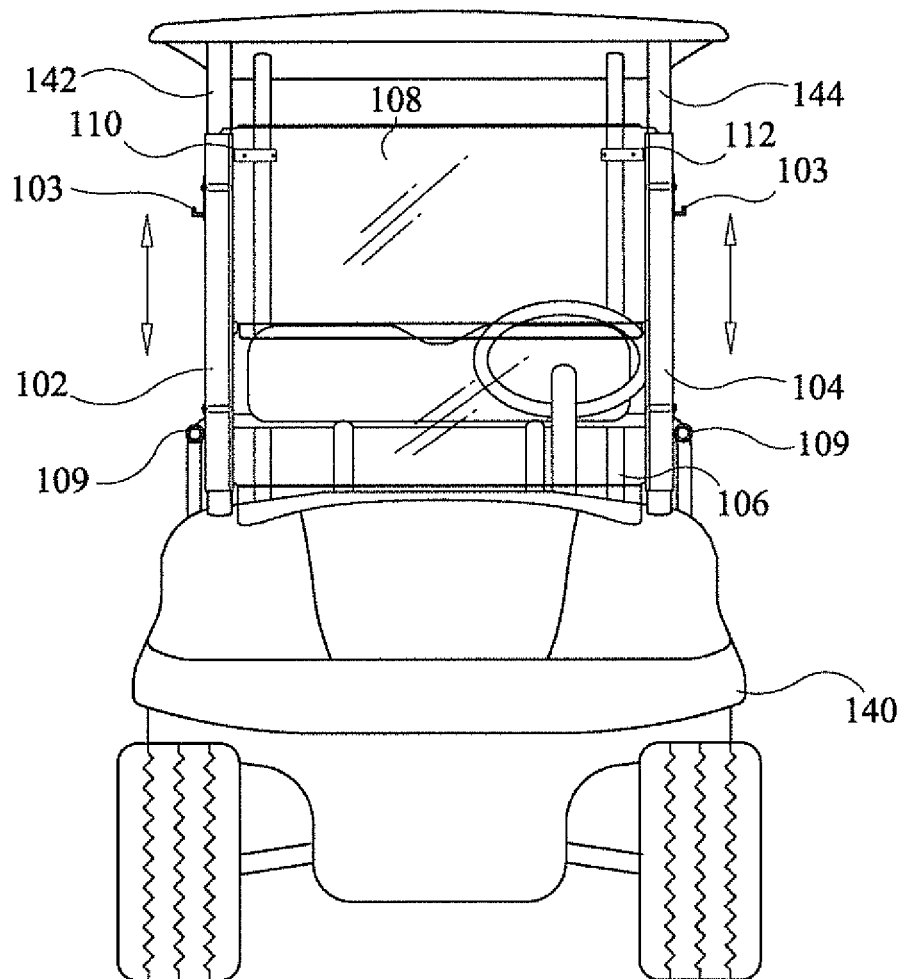


FIG. 7

1

UNIVERSAL GOLF CART WINDSHIELD ASSEMBLY

I. FIELD OF THE DISCLOSURE

The present disclosure is generally related to a universal golf cart windshield assembly.

II. BACKGROUND

Golf carts are motorized vehicles that are most often used by golfers when playing a round of golf. Although golf is generally played in favorable weather conditions, there are instances when additional protection from cold weather, wind or rain is needed to the occupants of the golf cart. The additional protection may be provided through the use of a windshield on the front of the golf cart. Prior art windshields for golf carts have included two panels where the top panel is adapted to open by folding down over the lower panel to provide an open area at the front of the golf cart. However, a shortcoming of the prior art golf cart windshields is the inability to easily and effectively secure the upper panel when in an open position and folded down over the lower panel. Most windshields cannot be opened or closed from inside the golf cart. You must exit the car to open or close the windshield. Current windshields use rubber clips that over time get hard and crack rendering them inoperable. Current windshields typically have a PVC hinge connecting the top and the bottom. These hinges by nature turn yellow obstructing the view from the golf cart.

Other prior art windshields are designed to be completely removed from the golf cart or are required to be stored on the roof portion of the golf cart. Thereby, making such prior art windshields inconvenient and cumbersome to maneuver. None of the prior art golf cart windshields have the ability to be adjusted to provide an opening of variable height or to accommodate various widths and configurations of vertical supports that are used to secure the windshield to the golf cart.

It is, therefore, to the effective resolution of the aforementioned problems and shortcomings of the prior art that the present invention is directed.

However, in view of the prior art at the time the present invention was made, it was not obvious to those of ordinary skill in the pertinent art how the identified needs could be fulfilled.

III. SUMMARY

In a particular embodiment, a universal golf cart windshield assembly is disclosed. In a particular embodiment, the assembly includes a pair of elongated rails and a bracket secured to each rail, where each bracket is configured to clamp over a vertical support member of a golf cart. A longitudinal slot is disposed on each rail and a flange is joined along a longitudinal edge of the longitudinal slot and extends generally at a right angle to the slot. A plurality of apertures are disposed on the flange of each rail. The assembly also includes a lower windshield pane and an upper windshield pane, where opposing edges of the upper windshield pane are slidably engaged with the respective longitudinal slot of each rail. In addition, the assembly also includes a spring loaded latch secured to the upper windshield pane, where the pin is adapted to engage a desired aperture of the flange to restrain the upper windshield pane in a desired vertical position.

2

One particular advantage provided by embodiments of the universal golf cart windshield assembly is the ability to vertical adjust the opening in the windshield. This is particularly advantageous to open the windshield to provide additional breeze to the occupants of the golf cart and to easily and conveniently close the opening in cooler or less favorable weather conditions. In addition, the brackets that attach the rails to the golf cart are adjustable to various widths of vertical supports and also can rotate to accommodate various angles of the vertical supports. The upper windshield pane can be raised and lowered to the desired position with only one hand from inside the golf cart. Further, the construction of typical golf cart windshields required the replacement of the entire assembly should the top or bottom pane be damaged. In contrast, the universal golf cart windshield assembly is fabricated such that an individual part may be replaced without replacing the entire windshield assembly.

Other aspects, advantages, and features of the present disclosure will become apparent after review of the entire application, including the following sections: Brief Description of the Drawings, Detailed Description, and the Claims.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective front view of a particular embodiment of a universal golf cart windshield assembly;

FIG. 2 is a perspective rear view of the universal golf cart windshield assembly of FIG. 1;

FIG. 3 is a partial rear perspective view of an elongated rail of the universal golf cart windshield assembly;

FIG. 4 is front perspective view of a bracket to secure the universal golf cart windshield assembly to a golf cart;

FIG. 5 is a partial perspective view of a windshield and elongated rail of the golf cart windshield assembly;

FIG. 6 is an exploded perspective view of the universal golf cart windshield assembly; and

FIG. 7 is front view of the universal golf cart windshield assembly installed on the golf cart.

V. DETAILED DESCRIPTION

Referring to FIG. 1, a particular illustrative embodiment of a universal golf cart windshield assembly is disclosed and generally designated **100**. The windshield assembly **100** includes a first elongated rail **102** and a second elongated rail **104**. A lower windshield pane **106** and an upper windshield pane **108** are secured between the pair of elongated rails **102**, **104**. A first spring loaded latch **110** and a second spring loaded latch **112** are secured to the upper windshield pane **108**. The respective free end of the spring loaded latches **110**, **112** may be pulled to remove the opposing end of the latch from the respective elongated rail. When the latch is released, the latch springs back into the respective elongated rail. A hook **103** may be secured to an outer edge of the elongated rails **102**, **104** by snapping a male portion of the hook **103** to a female portion on the elongated rails **102**, **104**. Another accessory that may be included on the elongated rails **102**, **104** is a cigar holder **109** may be snapped to one or both of the elongated rails **102**, **104** as illustrated in FIG. 1.

The first elongated rail **102** is configured to be secured to a first vertical support member **142** of a golf cart **140** and the second elongated rail **104** is configured to be secured to a second vertical support member **144** of the golf cart **140**. Brackets **114** are used to secure the windshield assembly **100** to the golf cart **140**.

3

The elongated rails **102**, **104** may generally be square or any other shape, where the elongated rails **102**, **104** are configured to fit adjacent to the vertical support member **142**, **144** of the golf cart **140**. The windshield panes **106**, **108** are easily replaceable if damaged because they require no glue in contrast to prior art windshield assemblies.

Referring now to FIG. 2, the rear side of the universal windshield assembly **100** is illustrated. The elongated rails **102**, **104** are disposed on opposing sides and adapted to support the upper windshield pane **108** and the lower windshield pane **106**. The spring loaded latches **110**, **112** are secured to the upper windshield pane **108**. A lower edge of the upper windshield pane **108** overlaps the lower windshield pane **106** when the upper windshield pane **108** is in the uppermost vertical position. This provides a complete barrier that protects the driver and passenger of the golf cart from the weather such as wind and rain, for example. Existing typical golf cart windshields include two panes that are hinged together, which does not provide full protection from the elements through the gap between the panes in addition to not being vertically adjustable.

The lower windshield pane **106** is secured to the elongated rails using fastening means **116**, which can include bolts, screws, or adhesive, for example. The lower windshield pane **106** may have horizontally disposed slots so that the lower windshield pane **106** can be secured between vertical support members **142**, **144** of various golf carts that have varying dimensions.

The brackets **114** are used to removably secure the windshield assembly **100** to the golf cart **140**. The brackets **114** may have a square, round or other shaped interior surface to fit around the vertical support members **142**, **144**. The brackets **114** slip over the vertical support members **142**, **144** and then can be adjusted to clamp the windshield assembly **100** firmly in place.

A partial view of the elongated rail **104** is shown in FIG. 3. The first and second elongated rails **102**, **104** are mirror images of one another. A longitudinal slot **120** is disposed within each elongated rail **102**, **104**, where the longitudinal slot **120** is adapted to slidably engage an edge of the upper windshield pane **108**. The upper windshield pane **108** is adapted to slide within the longitudinal slot **122** and along the length of the longitudinal slot **122**. The upper windshield pane **108** is adapted to overlap the lower windshield pane **106** by sliding within the longitudinal slot **122**, where the longitudinal slot **122** is offset from the lower windshield pane **106**. As described above, the upper windshield pane **108** and the lower windshield pane **106** are adapted to fit between the vertical support members **142**, **144** of the golf cart **140**.

The upper windshield pane **108** is restrained in the desired vertical position using the spring loaded latches **110**, **112**, which engage apertures **122** disposed on a flange **124** of the elongated rails **102**, **104**. The flange **124** is orientated generally perpendicular to the upper windshield pane **108**. The spring loaded latches **110**, **112** are reciprocally movable between a first engaged position and a second retracted position using a finger hold **132**. The apertures **122** may have a triangular contour, for example, so that an end **130** of the spring loaded latch **112** can more easily find and seat into the desired aperture **122** as the upper windshield pane **108** is moved up or down. For example, the user can move the upper windshield pane **108** upwards from one aperture **122** to the next and the sloping upper edge of the aperture **122** will cause the end **130** of the spring loaded latch **112** to move inward and release. When the upper windshield pane **108** is moved downward, the shape of the aperture **122** will grab

4

the end **130** of the spring loaded latch **112**, and secure the upper windshield pane **108** at the desired vertical location. In addition, the apertures **122** along the flange **124** may be any number and any spacing desired to accommodate the vertically adjustable upper windshield pane **108**.

Referring now to FIG. 4, the brackets **114** each include an interlocking top half **126** and bottom half **128**. A fastener (not shown) taken through an external boss **134** is used to secure the interlocking top half **126** and the bottom half **128** together in compression over the respective vertical support members **142**, **144**. The brackets **114** are adjustable in width as the interlocking top half **126** and the bottom half **128** are slidably engaged with one another. The bottom half **128** of the bracket **114** may be secured independently to the respective elongated rail **104**, or the same fastener used to secure the interlocking top half **126** and the bottom half **128** may be used to secure the bracket **114** to the elongated rail **104**.

Referring now to FIG. 5, the longitudinal slot **120** is sized so that the upper windshield pane **108** has clearance to slide up and down therein. The longitudinal slot **120** provides lateral support while maintaining linear translation in the vertical direction. In addition, the longitudinal slot **120** allows for thermal expansion of the upper windshield pane **108** and can accommodate variations in manufacturing tolerances, which may cause out of parallel conditions. A spacer **136** is disposed within a void along an edge of the upper windshield pane **108** that prevents the upper windshield pane **108** from rattling in the slot **120** when the golf cart **140** is riding over bumpy terrain. The spacer **136** projects from the edge of the upper windshield pane **108** towards an inner edge of the longitudinal slot **120** to provide a friction fit between the upper windshield pane **108** and the longitudinal slot **120** to provide resistance against a fast fall of the windshield pane **108**.

An exploded perspective view of the windshield assembly is shown in FIG. 6. For example, the elongated rails **102**, **104** are shown disposed on opposing sides of the lower windshield pane **106** and the upper windshield pane **108**. The voids along the edges of the upper windshield pane **108** are configured to receive the respective spacers **136**. The spacers **136** may be comprised of a resilient material. The spring loaded latches **110**, **112** are secured proximate an upper edge of the upper windshield pane **108**. The lower windshield pane **106** includes slots **142** that are used to pass fasteners **116** through to secure the lower windshield pane **106** to the elongated rails **102**, **104**. There are four brackets **114** shown in this particular illustrative embodiment. There are two brackets **112** disposed on each elongated rail **102**, **104** to secure the windshield assembly **100** to the golf cart **140**. In addition, each elongated rail **102**, **104** has a hook **103** for hanging a towel or golf glove, for example, and a cigar holder **109**.

As best illustrated in FIG. 7, the universal golf cart windshield assembly **100** is installed in the golf cart **140**. The elongated rails **102**, **104** are secured to the vertical support members **142**, **144** of the golf cart **140**. The vertical support members **142**, **144** of the golf cart **140** may be rectangular tubing, for example, so that the elongated rails **102**, **104** are adapted to fit generally flush against the vertical support members **142**, **144**. In an alternative embodiment, the support members **142**, **144** are round posts, for example, and the elongated rails **102**, **104** may be reciprocally round shaped to engage the round vertical support members **142**, **144**.

The overlap between the upper windshield pane **108** and lower windshield pane **106** is clearly visible. The upper windshield pane **108** is restrained in the desired vertical

5

position using the spring loaded latches **110**, **112**, which engage apertures **122** disposed on a flange **124** of the elongate rails **102**, **104**. As explained above, the spring loaded latches **110**, **112** are reciprocally movable between a first engaged position and a second retracted position. The apertures **122** are configured so that the latches can easily find and seat into the desired aperture **122**. The user can allow the windshield pane **108** to slide down from one aperture **122** to the next and the shape of the aperture **122** and the end **130** of the spring loaded latches **110**, **112** will grab the respective pin **130** and secure the windshield pane **108**.

The previous description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the disclosed embodiments. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the principles defined herein may be applied to other embodiments without departing from the scope of the disclosure. Thus, the present disclosure is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope possible consistent with the principles and novel features.

What is claimed is:

1. A universal golf cart windshield assembly, the assembly comprising:

- a pair of elongated rails;
- a bracket secured to each rail, wherein the bracket is configured to clamp over a vertical support member of a golf cart;
- a longitudinal slot disposed on each rail;
- a flange joined along a longitudinal edge of the longitudinal slot and extending outwardly from the longitudinal edge of the slot; and
- at least one aperture is disposed on the flange of each rail.

2. The universal golf cart windshield assembly of claim 1, further comprising an upper windshield pane, wherein opposing edges of the upper windshield pane are slidably engaged with the respective longitudinal slot of each rail.

3. The universal golf cart windshield assembly of claim 2, further comprising a spring loaded latch secured to the upper

6

windshield pane, wherein the pin is adapted to engage the at least one aperture of the flange to restrain the upper windshield pane in a desired vertical position.

4. The universal golf cart windshield assembly of claim 1, the bracket further comprising an interlocking top and bottom portion adjustable to a desired width of the vertical support member.

5. The universal golf cart windshield assembly of claim 4, further comprising a lower windshield pane secured to the pair of rails, wherein the upper windshield pane is configured to overlap the lower windshield pane by sliding within the longitudinal slot.

6. The universal golf cart windshield assembly of claim 2, wherein the upper windshield pane and the lower windshield pane are adapted to fit between the vertical support members of the golf cart.

7. The universal golf cart windshield assembly of claim 1, wherein the vertical support members of the golf cart are rectangular tubing.

8. The universal golf cart windshield assembly of claim 3, wherein the spring loaded latch is reciprocally movable within a tubular housing between a first position and a second position.

9. The universal golf cart windshield assembly of claim 1, wherein the flange further comprising a plurality of apertures disposed along its length used to adjust the desired vertical position of the upper windshield pane.

10. A universal golf cart windshield assembly, the assembly comprising:

- a pair of rails, wherein each rail of the pair of rails comprising:
 - a longitudinal slot disposed, wherein the slot is configured to receive an edge of a windshield pane; and
 - a flange joined along a longitudinal edge of the longitudinal slot and extending outwardly from the longitudinal slot, wherein the flange further comprising a plurality of apertures.

* * * * *